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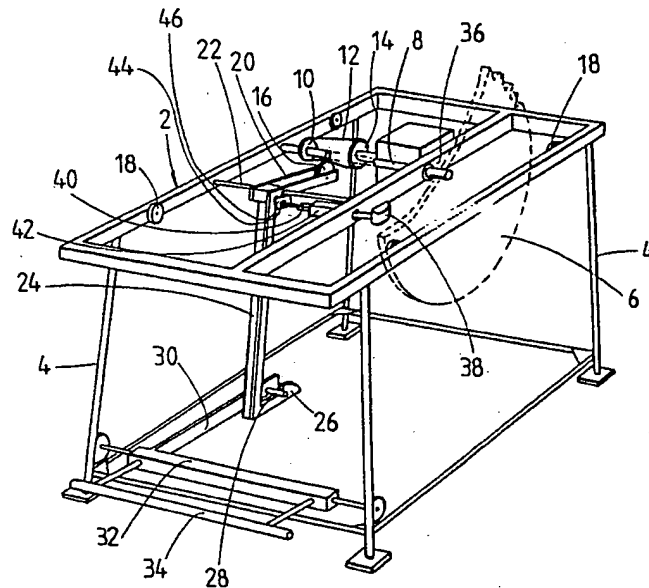
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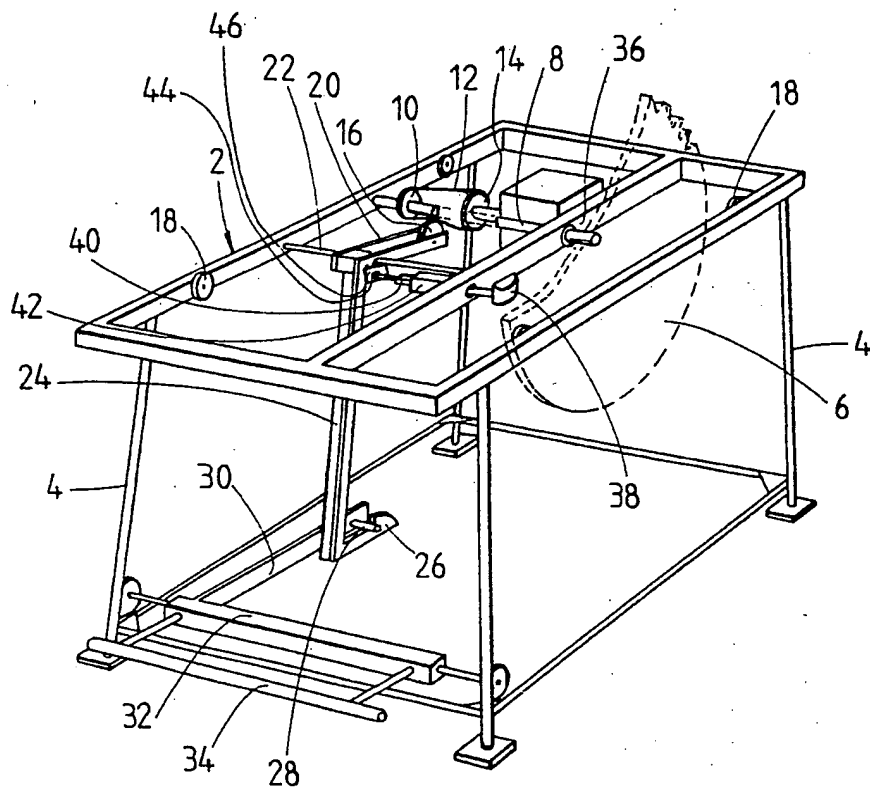
(54) Circular saws

(57) A circular saw having an emergency release coupling 34, 24, 46, 40 is provided with a brake pad 38, which is actuated together with the release coupling so as to act as a disc brake pad 38 cooperating directly with the circular saw blade 6. With this arrangement the saw blade 6 will rapidly stop by an emergency release, even when it is otherwise idling.



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SPECIFICATION

A circular saw with emergency release coupling

- 5 The present invention relates to a circular saw for wood, particularly for firewood or boards, and of the type having a support frame and a saw table, a motor or power intake being drivingly connected with the circular saw blade through a releasable coupling as having a easily accessible actuator element.

Circular saws of this type are typically adapted to be drivingly connected with the rotating driving shaft of a tractor, and normally the saw blade is held in constant operation through working periods of considerable lengths. However, the said coupling is required for enabling the saw blade to rapidly stop sawing, in case of need, and mostly the actuator element is constituted by a kick bar mounted so as to enable to operator to easily and quickly release the coupling by the foot. Normally the coupling consists of a simple V-belt drive, the V-belt of which is slackened by the actuation of the kick bar, whereby the latter operates as an emergency stop.

- 25 Saws of the discussed type are normally provided with rather large saw blades having a considerable inertia. If the coupling is released during active sawing the saw blade will stop almost instantly by its friction with the workpiece, but if the release takes place while the saw blade is idling the blade, by its inertia, will continue its rotation and hereby present a danger to the operator or others.

It is the purpose of the invention to provide a circular saw, in which this danger is counteracted.

- 35 The invention is based on the recognition that the saw blade itself is well suited for use as a disc brake element and that the actuator element of the coupling may, in a simple manner, be operatively connected with a brake shoe, such that a releasing of the coupling will automatically effect a rapid stopping of the saw blade, also when the latter is idling. Thus, the invention provides for a very efficient emergency braking in a very simple manner, viz. just by forcing a simple brake shoe against an already existing brake disc, namely the saw blade itself, in the lower inoperative area thereof.

- According the circular saw of the present invention is characterized in that outside a side portion of the saw blade there is arranged a brake shoe, which is operatively connected with the releasable drive coupling so as to be forced against the saw blade in response to the coupling being released.

- In a preferred embodiment of the invention use is made of an axially displaceable brake rod, which projects towards the side of the saw blade underneath the saw table, and a spring is held compressed such that a brake shoe at the end of the rod is located slightly spaced from the side of the saw blade, while the other end of the rod cooperates with the actuator element of the coupling in such a cam controlled manner that the brake rod is displaced towards the saw blade in response to the actuator element being operated for releasing the coupling. Hereby a simple, robust and safely operating arrangement is achieved.

In the following the invention is described in more detail with reference to the accompanying drawing, which, partly in section, shows a perspective view of a circular saw according to the invention.

- 70 The circular saw conventionally comprises a support having a top frame 2 and a number of legs 4. The saw blade, designated 6, is mounted on a shaft 8 as driven by a V-belt pulley 10. The pulley 10 is driven through a belt 12 from or by another pulley 14, which is itself, in a manner not illustrated, driven by a motor or by a coupling member to be connected with the rotating drive shaft of a tractor. The belt 12 is overlong, but is held tight by means of a pressure roller 16, such that the saw blade may work continually.

- On the top frame is mounted a number of upwardly projecting rollers 18 for supporting a reciprocable saw table in well known and non-illustrated manner. The saw table has an upstanding half screen normally covering the rear upper half of the saw blade.

- The pressure roller 16 is mounted at the outer end of a pivot level 20, which is rigidly mounted on a rotatable cross shaft 22 as additionally connected with a depending actuator arm 24. This arm, at its lower end, has a hook member 26 cooperating with a pawl 28 on a releaser arm 30, the front end of which is rigidly connected with a rotatable cross rod 32 as provided with a forwardly projecting structure including a foot bar 34. When this foot bar is pressed downwardly the releaser arm 30 is swung upwardly so as to liberate the hook member 26 from the pawl 28, whereby the pressure roller 16, because of its own weight and the weight of the pivot level 20 and optionally assisted by a spring force, will swing downwardly during forward pivoting of the actuator arm 24. By the associated lowering of the pressure roller 16 the belt 12 will get slackened sufficiently to immediately break the drive operation of the belt.

- The saw so far described is well known in the art.

- The top frame 2 comprises a beam 36 carrying the main bearing of the saw blade 6. According to the invention a brake shoe 38 is arranged near this beam and near the relevant side of the saw blade 6. The brake shoe is mounted on a brake rod 40 as projecting towards the left through a rigid guide bushing 42 and ending in an axially adjustable screw 44. Outside this screw is provided a cam plate member 46 connected with the rotary shaft 22, e.g. mounted on a part of the pivot level 20 or the actuator arm 24, the cam plate member 46 being so positioned and inclined as to be moved, by the said release pivoting of the arm system 20,24, from an inactive position, in which it is either out of engagement with the adjacent end of the brake rod 40, when the latter is held by a separate, fixed stop, or forms an abutment for the brake rod in the illustrated position thereof, to an active position, in which it forces the brake rod 40 forwardly towards the saw blade 6, such that the saw blade will be stopped by the associated frictional engagement with the brake shoe 38.

- For restarting the saw blade the operator just has to use a foot for urging the actuator arm 24 forwardly, whereby the pawl engagement 26,28 is

reestablished and the cam plate member 46 causes the brake rod 40 and the brake shoe 38 to be retracted from the saw blade by virtue of the said spring, and at the same time the pressure roller 16 is swung upwardly so as to reactuate the belt drive coupling.

As shown in the drawing Figure the brake shoe 38 cooperates with the saw blade 6 in an area well spaced from the centre of the blade, i.e. the braking momentum can be rather high without the use of any special or separate brake disc. It has been found that an ordinary circular saw blade is perfectly suited to resist a braking pressure of the required magnitude without requiring a counter pressure brake on the other side of the blade.

The shaft 22 of the pivot level 22 and the cam plate member 46 is mounted axially non-displaceable. In that case the remaining construction may be produced with rather coarse tolerances, since the brake rod 40 is easy to adjust into an exactly correct position by adjusting the screw 44 or a corresponding abutment means, which should, of course, be locked in its adjusted position.

The invention is not limited to the embodiment shown, as the brake shoe may be otherwise actuated by the release of the driving coupling. The brake rod may be arranged so as to be forced towards the saw blade with a well defined spring force, while the cam control should then be designed to respond to the release of the coupling by releasing the brake rod from a normally retracted position, in which it is held by the cam member.

CLAIMS

1. A circular saw for wood, particularly for firewood and boards, and of the type having a support frame and a saw table, a motor or power intake being drivingly connected with the circular saw blade through a releasable coupling as having an easily accessible actuator element, characterized in that outside a side portion of the saw blade there is arranged a brake shoe, which is operatively connected with the releasable drive coupling so as to be forced against the saw blade in response to the coupling being released.

2. A circular saw according to claim 1, in which the brake shoe is mounted on an axially displaceable brake rod, which, by means of a cam control device, is operable to get displaced towards the saw blade in response to actuation of a pivotable coupling release system.

3. A circular saw according to claim 1, substantially as shown and described.